

STATUS OF WHITE-STRIPED FREE-TAILED BAT, *TADARIDA AUSTRALIS*, ON ROTTNEST ISLAND

By JOHN DELL

Department of Environment and Conservation, Locked Bag 104,
Bentley Delivery Centre, WA 6983

ABSTRACT

The White-striped Free-tailed Bat is confirmed as occurring on Rottneest Island by a specimen and records of echolocation calls at night. Presence/absence records indicate that it is mainly a summer/autumn visitor which is comparable to its partly migratory status published by previous authors in other parts of Western Australia.

INTRODUCTION

The White-striped Free-tailed Bat, *Tadarida australis* (Note: name usage here follows the recommended common name and spelling for the species, Armstrong and Reardon 2006), is a relatively large insectivorous bat whose range encompasses most of the Australian continent except the tropical savannah of northern Australia, Queensland east of the Great Dividing Range, and Tasmania (Bullen and McKenzie 2005). These authors concluded that in Western Australia the White-striped Free-tailed Bat was absent from the Kimberley and Pilbara uplands and sparse in the southwestern forests and Nullarbor. They demonstrated that it was a partial migrant whose Western Australian range expanded northwards by up to 1200 km in

winter when a proportion of the population moved north in April with falling temperatures, and a contraction occurred southwards in the summer when the heightened productivity in late spring and early summer in these areas provided adequate food to support recruitment (Bullen and McKenzie 2005). Its seasonal distribution and the areas showing periods of absence in Western Australia are shown in Figure 3 in Bullen and McKenzie (2005).

In the southern part of its range south of 29.5° (i.e. south of Dongara), Bullen and McKenzie (2005) showed that it had a preference to remain inland, i.e. greater than 5km from the coast, and only occasionally approached the coast. Absences were attributed to a possible lack of insect productivity as well as other reasons.

The White-striped Free-tailed Bat begins to fly after dark and continues to forage for several hours and appropriate echo-location survey techniques are a reliable method for determining presence or absence (Bullen and McKenzie 2005). It has a distinctive audible, constant-frequency search-mode call (McKenzie and Bullen 2003) which is unique and below all other bat species in Western Australia and is powerful, audible to humans and carries for hundreds of metres so its presence/absence is very obvious during field surveys (Bullen and McKenzie 2005).

The White-striped Free-tailed Bat forages above the canopy at high speeds (Bullen and McKenzie 2001) although it occasionally descends to the ground in search of terrestrial insects (Richards 1995).

There is no published information on the presence or status of the White-striped Free-tailed Bat on islands off the west coast of southern Western Australia.

RECORDS AND OBSERVATIONS ON ROTTNEST ISLAND

There are anecdotal observations of the occurrence of bats on Rottnest Island, although these observations lack specific identification. The presence of White-striped Free-tailed Bat, *Tadarida australis* was confirmed on Rottnest Island with the collection of a mummified

specimen (WA Museum collection number M47594) from the Lighthouse at Wadgemup Hill in July 2004. This specimen may have been present in its mummified state inside a building for months if not years, so its collection date is not indicative of time of occurrence.

As stated above, the presence or absence of White-striped Free-tailed Bats can easily be determined by listening for its distinctive echo-location calls at night. Regular visits by me since 2002 to conduct reptile surveys has allowed determination of presence/absence records of White-striped Free-tailed Bats on Rottnest Island. Survey dates, times (only those dates/times when I was able to make records at night are included), localities and records (shown in bold) are:

- 18 September 2002 (1840 – 2130 hours): Thomson Bay/Settlement and 10 localities as far west as Wadgemup Hill – nil
- 7 November 2002 (2000–2130hr): Kingstown, Thomson Bay and most lakes – **calling at Corio Swamp and Thomson Bay at 2115hr**
- 8–9 November 2002 (2000–2100hr): Kingstown and Thomson Bay areas – nil
- 30 November–1 December 2002 (2000–2130hr): Thomson Bay, Kingstown areas – nil
- 14–15 March 2003 (2000–2130hr): several sites around lakes, Thomson Bay, Research Station and Kingstown areas visited – nil

- 21 April 2003 (1945–2400hr): most lakes, Thomson Bay, Research Station and Kingstown areas visited: **calling near Armstrong Point and near Pink Lake at 1950hr, west of Lake Baghdad at 2000hr**
- 17 May 2003 (1730–2230hr): Kingstown, Thomson Bay and most lakes west to Wadgemup Hill – **calling at Serpentine Lake at 220hr**
- 31 May 2003 (1930–2215hr): Kingstown, Thomson Bay and most lakes – nil
- 1 June 2003 (1930–2100hr): Kingstown and Thomson Bay areas – nil
- 28 June 2003 (2100–2145hr): several sites around airport – nil
- 25 July 2003 (1950–2240 hr): most lakes, Thomson Bay and Kingstown areas – **calling at Lake Timperley 2135–2145hr and Serpentine Lake 2148–2200hr**
- 26 July 2003 (2000–2215hr): several sites around lakes, Thomson Bay and Kingstown areas – nil
- 12–13 September 2003 (2000–2130hr): several sites around lakes, Thomson Bay, Research Station and Kingstown areas – nil
- 7–8 November 2003 (1930–2130hr): Kingstown and Thomson Bay areas – nil
- 28 February 2004 (2000–2200hr): Thomson Bay, Research Station and Kingstown areas – nil
- 29 February 2004 (2000–2230hr): Kingstown to West End and return to Thomson Bay and Kingstown – **calling near Wadgemup Hill at 2045hr, Garden Lake at 2050hr, Corio Swamp and Thomson Bay at 2115hr, 100 m. east of Narrowneck at 2135hr, 600 m. east of West End at 2139hr and Kingstown at 2220hr**
- 30 April 2004 (2030–2240hr): several sites around lakes, Thomson Bay, and Research Station – **calling at Barker Swamp 2100hr**
- 1 May 2004 (2030–2200hr): Thomson bay and Research Station – nil
- 14 May 2004 (1900–2130hr): most lakes, Thomson Bay, and Research Station – nil
- 15–17 October 2004 (2000–2130hr): Thomson Bay, Research Station and Kingstown – nil
- 5–6 November 2004 (2000–2200hr): Thomson Bay, Research Station and Kingstown – nil
- 3–4 December 2004 (2000–2200hr): Thomson Bay, Research Station and roads west to Wadgemup Hill – nil
- 4 March 2005 (2000–2200hr): most lakes, Thomson Bay, and Research Station – nil
- 5 March 2005 (2000–2200hr): Thomson Bay, and Research Station – nil
- 6 March 2005 (2000–2130hr): Thomson Bay, Research Station and roads to Geordie and Armstrong bays – **calling**

- near Geordie Bay at 2035hr and south of Armstrong Bay at 2045hr
- 11–12 November 2005 (2045–2130hr): most lakes, Thomson Bay, and Research Station – nil
- 2–4 December 2005 (2000–2130hr): Thomson Bay, Research Station and nearby sites – nil
- 24–25 February 2006 (2000–2200hr): Thomson Bay, Research Station and numerous sites to West End – nil
- 17–18 March 2006 (2000–2230hr): Thomson Bay and Research station areas – calling at Research Station 2230 hr on 17 March and Thomson Bay 2045hr on 18 March
- 21 April 2006 (2030–2300hr): areas from Kingstown, Thomson Bay to Geordie Bay, most lakes and Research Station – calling at Kingstown 2145hr, Geordie Bay 2200hr, Pink and Negri Lakes 2220hr, Lake Baghdad 2235hr, Thomson Bay 2250hr, and Research Station 2255hr
- 22 April 2006 (2030–2200hr): areas from Research Station to Wadgemup Hill including some lakes – calling at Wadgemup Hill 2120hr
- 17–19 November 2006 (2030–2300hr): numerous sites throughout island – nil
- 8 December 2006 (2030–2300hr) numerous sites eastern end of island – nil
- 9 December 2006 (2050–2300hr): numerous sites West End to Research Station – nil
- 10 December 2006 (2050–2250hr): numerous sites from Research Station to Geordie Bay and some lakes – calling at Geordie Bay 2145hr and Research Station 2250hr
- 20 December 2006 (2030–2315hr): numerous sites from West End to Research Station – nil
- 23 February 2007 (2030–2215hr): numerous sites from Kingstown via Parker Point, Salmon Bay, Wadgemup Hill to Thomson Bay and Research Station – calling north of Oliver Hill 2120hr
- 24 February 2007 (2030–2230hr): numerous sites Cape Vlamingh to Research Station – calling 100m. west of Green Island 2124hr, Lighthouse Swamp 2136hr, 600m. north-east of Lighthouse Swamp 2142hr, near Corio Swamp 2016hr
- 25 February 2007 (2000–2250 hr): numerous sites from Green Island via north side of island to Geordie Bay, Oliver Hill, Thomson Bay and Research Station – calling south of Stark Bay 2106hr, west side of Lake Baghdad 2135hr, near Pink Lake 2201hr, between Garden Lake and Lake Herschell 2212hr
- In total, 51 evenings were spent on Rottnest Island representing all months, except January and August, when presence/absence data for White-striped Free-

tailed Bats were possible to be recorded. Of these 51 dates, bats were recorded on 15 evenings for a total of 31 records. Locations where White-striped Free-tailed Bats were recorded indicate that they have been recorded virtually throughout the island.

White-striped Free-tailed Bats were recorded in seven (February, March, April, May, July, November, December) of the ten months when records were possible. There was a strong seasonal bias with 77.4% of records in the months February to April despite the fact that these months only constituted 37.3% of nights when records were possible. February was the most frequent month when White-striped Free-tailed Bats were recorded with 16 records from a possible seven observation nights which comprised about half of all the records. Of particular note was a warm night on 29 February 2004 after a day maximum of 33.3°C (February mean is 27.2°C) when the temperature between 20.00hr and 22.00hr was 24°C (February mean for this time is 22°C) when numbers of White-striped Free-tailed Bats were recorded at seven localities throughout the entire length of the island. (Weather data provided by Climate Service Centre, WA Regional Office Australian Bureau of Meteorology).

DISCUSSION

Records of calling White-striped Free-tailed Bats on Rottnest

Island indicate that they appear to be mainly a summer/autumn visitor with peak visitations occurring in February, although occasionally they can be recorded as late as July. This seasonal occurrence fits well with the conclusions of Bullen and McKenzie (2005) who concluded that in Western Australia a proportion of the population moved north in April with falling temperatures, and a southward movement occurred in the summer.

Although Bullen and McKenzie (2005) stated that in the southern part of its range south of 29.5° the White-striped Free-tailed Bat had a preference to remain inland, i.e. greater than 5km from the coast, and only occasionally approached the coast, on occasions it visits offshore islands fairly frequently as recorded here for Rottnest Island. The duration of time spent on Rottnest Island is not known, nor is any information available on foraging ecology.

The White-striped Free-tailed Bat is known to forage above the canopy at high speeds (Bullen and McKenzie 2001) although it occasionally descends to the ground in search of terrestrial insects (Richards 1995). At a similar time to when White-striped Free-tailed Bats are recorded on Rottnest Island, it is known that an avian diurnal aerial insectivore, the Australian Tree Martin, *Hirundo nigricans*, visits Rottnest Island in large numbers in late summer/autumn

prior to northwards migration (Dell and Harris 2007). Possibly the weather conditions that result in abundant food resources for Tree Martins on Rottnest Island in summer/autumn could also be conducive to abundant food resources for White-striped Free-tailed Bats and thus encouraging their flight at least 26 km off the Western Australian coast. Whether there is overlap in prey items consumed by a diurnal compared to a nocturnal feeding species is unknown.

ACKNOWLEDGEMENTS

I would like to thank the Rottnest Island Authority for supporting the reptile survey of Rottnest Island which made the collection of data reported on here possible. Rottnest Island staff, especially Harriet Davie and Barbara Green, and Rottnest volunteer Courtney Wheatley, are particularly thanked for coordinating the reptile surveys. Courtney Wheatley, Erin Harris and a number of other volunteers provided support during long hours at night in all weather conditions.

REFERENCES

- ARMSTRONG, K. and REARDON, T. 2006. Standardising the common names of Australian bats – an update. *The Australasian Bat Society Newsletter*, Number 26, April 2006: 37–42.
- BULLEN, R.D. and MCKENZIE, N.L. 2001. Bat airframe design – flight performance, stability and control in relation to foraging ecology. *Australian Journal of Zoology* 49: 235–261.
- BULLEN, R.D. and MCKENZIE, N.L. 2005. Seasonal range variation of *Tadarida australis* (Chiroptera: Molossidae) in Western Australia: the impact of enthalpy. *Australian Journal of Zoology* 53: 145–156.
- DELL, J. and HARRIS, E. 2007. Status and pre-migrating aggregations of Tree Martins on Rottnest Island. *Western Australian Naturalist* 25: 259–262.
- MCKENZIE, N.L. and BULLEN, R.D. 2003. Identifying Little Sandy Desert bat species from their echolocation calls. *Australian Mammalogy* 25: 73–80.
- RICHARDS, G.C. 1995. White-striped Freetail-bat, *Nyctinomus australis*. Pp. 487–488 In: R. Strahan (ed.) *The Mammals of Australia*. Australian Museum/Reed Books, Sydney.